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Multicast security and its extension to a mobile environment

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↑ ABSTRACT

Multicast is rapidly becoming an important mode of communication and a good platform for building group-oriented services. To be used for trusted communication, however, current multicast schemes must be supplemented by mechanisms for protecting traffic, controlling participation, and restricting access of unauthorized users to data exchanged by the participants. In this paper, we consider fundamental security issues in building a trusted multicast facility. We discuss techniques for group-based data encryption, authentication of participants, and preventing unauthorized transmissions and receptions. We also describe the application of these principles and techniques in designing an architecture for secure multicast in a mobile environment.

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1 [Performance Considerations for an Embedded Implementation of OMA DRM 2](#)

Daniel Thull, Roberto Sannino

 March 2005 **Proceedings of the conference on Design, Automation and Test in Europe - Volume 3 DATE '05**

Publisher: IEEE Computer Society

 Full text available: [pdf\(139.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

As digital content services gain importance in the mobile world, Digital Rights Management (DRM) applications will become a key component of mobile terminals. This paper examines the effect dedicated hardware macros for specific cryptographic functions have on the performance of a mobile terminal that supports version 2 of the open standard for Digital Rights Management defined by the Open Mobile Alliance (OMA). Following a general description of the standard, the paper contains a detailed analy ...

Keywords: DRM, Security, Mobile Terminal, Cryptography

2 [DRM usability and legal issues: Import/export in digital rights management](#)



Reihaneh Safavi-Naini, Nicholas Paul Sheppard, Takeyuki Uehara

 October 2004 **Proceedings of the 4th ACM workshop on Digital rights management DRM '04**

Publisher: ACM Press

 Full text available: [pdf\(211.60 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The inherently controlled nature of digital rights management systems does little to promote inter-operability of systems provided by different vendors. In this paper, we consider import and export functionality by which multimedia protected by one digital rights management regime can be made available to a multimedia device that supports a different digital rights management regime, without compromising the protection afforded to the content under the original regime. We first identify speci ...

Keywords: digital rights management, export, import, inter-operability

3 [DRM experience: Digital rights management in a 3G mobile phone and beyond](#)

Thomas S. Messerges, Ezzat A. Dabbish

 October 2003 **Proceedings of the 3rd ACM workshop on Digital rights management**

DRM '03**Publisher:** ACM PressFull text available: [pdf\(306.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#)

In this paper we examine how copyright protection of digital items can be securely managed in a 3G mobile phone and other devices. First, the basic concepts, strategies, and requirements for digital rights management are reviewed. Next, a framework for protecting digital content in the embedded environment of a mobile phone is proposed and the elements in this system are defined. The means to enforce security in this system are described and a novel "Family Domain" approach to content management ...

Keywords: MPEG-21, copyright protection, cryptography, digital content, digital rights management, embedded system, key management, mobile phone, open mobile alliance, security

4 Digital rights management & protecting the digital media value chain

Marvin L. Smith

October 2004 **Proceedings of the 3rd international conference on Mobile and ubiquitous multimedia MUM '04****Publisher:** ACM PressFull text available: [pdf\(95.20 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Digital media that is readily & illegally distributed over the Internet and related digital networks has posed major problems for the members of the digital media value chain. Ubiquitous mobile communication devices such as media capable handsets and PDAs have made the problem even larger. Technical approaches to controlling illegal distribution---commonly known as Digital Rights Management (DRM)---have been varied and inconsistent since the shift from analogue media to digital media; but in rec ...

Keywords: combined delivery, digital media, digital rights management (DRM), forward lock, open mobile alliance (OMA), rights expression language (REL), separate delivery

5 Digital rights management: Sharing digital rights with domain licensing

Nicholas Paul Sheppard, Reihaneh Safavi-Naini

October 2006 **Proceedings of the 4th ACM international workshop on Contents protection and security MCPS '06****Publisher:** ACM PressFull text available: [pdf\(219.89 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Sharing of multimedia content is a common practice that, combined with appropriate business models, need not be detrimental to the interests of content providers. Existing digital rights management systems, however, support only relatively limited sharing of content between multimedia terminals, resulting in inconvenience and frustration for end-users of rights-managed content. In this paper, we propose to combine the notion of an "authorised domain" with an "environment role" to permit end-user ...

Keywords: authorised domains, digital rights management

6 Translation of rights expressions

Brenton Cooper, Paul Montague

January 2005 **Proceedings of the 2005 Australasian workshop on Grid computing and e-research - Volume 44 ACSW Frontiers '05****Publisher:** Australian Computer Society, Inc.

Full text available:  [pdf\(94.67 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Digital Rights Management (DRM) is concerned with the controlled distribution and usage of digital works in order to prevent unauthorized usage of digital content. A significant component of a DRM system is a well-defined language for expressing the rights which a user/device has been granted. Such a language is known as a Rights Expression Language (REL). Various technical communities have developed alternative rights expression languages. It is expected that in the marketplace different rights ...

Keywords: digital rights management, export, import, rights expression language, translation

7 Architectures: Achieving media portability through local content translation and end-to-end rights management



David W. Kravitz, Thomas S. Messerges

November 2005 **Proceedings of the 5th ACM workshop on Digital rights management DRM '05**

Publisher: ACM Press

Full text available:  [pdf\(376.29 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The problem addressed in this paper is that of DRM interoperability. The term DRM interoperability, as used here, refers to approaches that provide for the transfer, from one "upstream" DRM system to another "downstream" DRM system, of DRM protected content and an associated license. We introduce the concept of a Rights Issuer Module (RIM) that is functionally situated in the home network between the upstream device (which includes an upstream-DRM agent) and downstream devices (which each include ...

Keywords: MPEG-21, NEMO, copyright protection, coral, digital content, digital rights management, export, import, interoperability, open mobile alliance, security

8 Software issues: Towards a software architecture for DRM



Sam Michiels, Kristof Verslype, Wouter Joosen, Bart De Decker

November 2005 **Proceedings of the 5th ACM workshop on Digital rights management DRM '05**

Publisher: ACM Press

Full text available:  [pdf\(296.34 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The domain of digital rights management (DRM) is currently lacking a generic architecture that supports interoperability and reuse of specific DRM technologies. This lack of architectural support is a serious drawback in light of the rapid evolution of a complex domain like DRM. It is highly unlikely that a single DRM technology or standard will be able to support the diversity of devices, users, platforms, and media, or the wide variety of system requirements concerning security, flexibility, a ...

Keywords: DRM, software architecture

9 Software and languages: The problem with rights expression languages



Pramod A. Jamkhedkar, Gregory L. Heileman, Iván Martínez-Ortiz

October 2006 **Proceedings of the ACM workshop on Digital rights management DRM '06**

Publisher: ACM Press

Full text available:  [pdf\(294.74 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we consider the functionality that a rights expression language (REL) should

provide within a digital rights management (DRM) environment. We begin by noting the dearth of applications that make use of RELs, despite the fact that they have now been available since the late 1990's. We posit that one of the main impediments to the use of RELs is the complexity associated with understanding and using them. This results from the fact that the functionality needed to handle a wide varie ...

Keywords: DRM, architecture, rights expression language

10 Architechture: Towards a secure and interoperable DRM architecture

 Gelareh Taban, Alvaro A. Cárdenas, Virgil D. Gligor
October 2006 **Proceedings of the ACM workshop on Digital rights management DRM '06**


Publisher: ACM Press

Full text available:  [pdf\(442.79 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we look at the problem of interoperability of digital rights management (DRM) systems in home networks. We introduce an intermediate module called the Domain Interoperability Manager (DIM) to efficiently deal with the problem of content and license translation across different DRM regimes. We also consider the threat model specific to interoperability systems, and introduce threats such as the cross-compliance and splicing attacks. We formalize the adversary model and define securit ...

Keywords: DRM, home networks, interoperability

11 Technical demonstration 2: media authoring and processing: MobiCon: integrated capture, annotation, and sharing of video clips with mobile phones

 Janne Lahti, Utz Westermann, Marko Palola, Johannes Peltola, Elena Vildjiounaite
November 2005 **Proceedings of the 13th annual ACM international conference on Multimedia MULTIMEDIA '05**

Publisher: ACM Press

Full text available:  [pdf\(351.80 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


This paper presents MobiCon, a video production tool for mobile camera phones. MobiCon integrates video clip capture with context-aware, personalized clip annotation -- supporting automatic annotation suggestions based on context data and efficient manual annotation with user-specific ontologies and keywords -- and clip sharing secured by digital rights management techniques. Thus, MobiCon allows users to inexpensively create metadata-annotated video clips for a better management of their clip c ...

Keywords: context-awareness, digital rights management, mobile video annotation, mobile video sharing, video management

12 Security in embedded systems: Design challenges

 Srivaths Ravi, Anand Raghunathan, Paul Kocher, Sunil Hattangady
August 2004 **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 3 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(3.67 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Many modern electronic systems---including personal computers, PDAs, cell phones, network routers, smart cards, and networked sensors to name a few---need to access, store, manipulate, or communicate sensitive information, making security a serious concern in their design. Embedded systems, which account for a wide range of products from the electronics, semiconductor, telecommunications, and networking industries, face

some of the most demanding security concerns---on the one hand, they are oft ...

Keywords: Embedded systems, architecture, authentication, battery life, cryptographic algorithms, decryption, encryption, hardware design, processing requirements, security, security attacks, security protocols, tamper resistance

13 Jeux et mobilité: GASP: un intergiciel pour les jeux en réseaux multijoueurs sur téléphones mobiles



R. Pellerin, F. Delpiano, E. Gressier-Soudan, M. Simatic

May 2005 **Proceedings of the 2nd French-speaking conference on Mobility and ubiquity computing UbiMob '05**

Publisher: ACM Press

Full text available: pdf(296.87 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper describes an ongoing work. We are designing and implementing a library of services dedicated to multiplayer on-line games for mobile phones. This library, called GASP, conforms to *Open Mobile Alliance* (OMA) v2.0 specifications. It is implemented in Java and offers a server and a client part. The latter is defined for MIDP 2.0 and DOJA 1.5 J2ME profiles. GASP v1.0 implements partially OMA specification: We are working on a new version more complete.

Keywords: DOJA, MIDP, OMA, game, mobile phones, multiplayer

14 Security issues for wireless networks: Secure access to IP multimedia services using generic bootstrapping architecture (GBA) for 3G & beyond mobile networks



Muhammad Sher, Thomas Magedanz

October 2006 **Proceedings of the 2nd ACM international workshop on Quality of service & security for wireless and mobile networks Q2SWinet '06**

Publisher: ACM Press

Full text available: pdf(541.17 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The IP Multimedia Subsystem (IMS) defined by Third Generation Partnership Projects (3GPP and 3GPP2) is a technology designed to provide robust multimedia services across roaming boundaries and over diverse access technologies with promising features like quality-of-service (QoS), reliability and security. The IMS defines an overlay service architecture that merges the paradigms and technologies of the Internet with the cellular and fixed telecommunication worlds. Its architecture enables the eff ...

Keywords: IP multimedia system, authentication proxy, generic authentication architecture, generic bootstrapping architecture, security and privacy, transport layer security

15 Which one should be chosen for the mobile geographic information service now, WAP vs. i-mode vs. J2ME?



Ye Lei, Lin Hui

December 2006 **Mobile Networks and Applications**, Volume 11 Issue 6

Publisher: ACM Press

Full text available: pdf(982.37 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The concepts of MGIS (Mobile Geographic Information System), LBS (Location Based Service) and MGI Service (Mobile Geographic Information Service) were introduced first. Then the consistency of the three wireless Internet access technology, WAP (Wireless Application Protocol), i-mode and J2ME (Java™2 Micro Edition) were proposed not only from the surfaces, but also from the architectures. Based on the analysis of the WAP, i-

mode and J2ME, the suggested suitable field of each techno ...

Keywords: GIS, J2ME, WAP, i-mode, mobile geographic information service

16 Specification and dynamic introduction of 3rd party, service-specific adaptation policies for mobile applications

Nikos Houssos, Nancy Alonistioti, Lazaros Merakos

August 2005 **Mobile Networks and Applications**, Volume 10 Issue 4


Publisher: Kluwer Academic Publishers

Full text available:  [pdf\(3.42 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The development, delivery and management of mobile services are the subject of many research activities in both the academia and industry. The ultimate goal of these efforts is a dynamic environment that enables the delivery of situation-aware, personalised multimedia services over heterogeneous, ubiquitous infrastructures, commonly termed as systems beyond 3rd generation (3G). Reconfigurability and adaptability are key aspects of the mobile systems beyond 3G. Reconfigurable mobile systems and n ...

Keywords: adaptation, mobile services, mobile systems beyond 3G, policies, reconfigurability

17 Research tools: Pegboard: a framework for developing mobile applications

 Danny Soroker, Ramón Cáceres, Danny Dig, Andreas Schade, Susan Spraragen, Alpana Tiwari

June 2006 **Proceedings of the 4th international conference on Mobile systems, applications and services MobiSys 2006**


Publisher: ACM Press

Full text available:  [pdf\(374.08 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Tool support for mobile application development can significantly improve programmer productivity and software quality. Pegboard is a novel tooling framework that extends the Eclipse integrated development environment to support the development of mobile distributed applications. Its extensible design supports multiple application models and the orchestration of external tooling components throughout the development cycle. In this paper we describe Pegboard's architecture and implementation, and ...

Keywords: application development, distributed applications, integrated development environments, mobile applications, user-centered design

18 Application requirements for middleware for mobile and pervasive systems

 Kimmo Raatikainen, Henrik Bærbak Christensen, Tatsuo Nakajima

October 2002 **ACM SIGMOBILE Mobile Computing and Communications Review**, Volume 6 Issue 4

Publisher: ACM Press

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In this paper, we examine the requirements for future middleware to support mobile and pervasive applications and identify key research areas. We illustrate the research areas with requirements identified in two specific research projects concerning pervasive healthcare and home entertainment.

19 Q focus: mobile applications: Mobile media: making it a reality

Fred Kitson



May 2005 **Queue**, Volume 3 Issue 4

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Two prototype apps reveal the challenges in delivering mobile media services.

20 Systems: Authorization for digital rights management in the geospatial domain

Andreas Matheus

November 2005 **Proceedings of the 5th ACM workshop on Digital rights management
DRM '05**

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Keywords: DRM, access control, geoXACML, geospatial

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